

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1-24. (canceled).

25. (new) A data storage system comprising:

a first data storage apparatus connected to a host computer; and

a second data storage apparatus configured to store data sent from said first data storage apparatus with an asynchronous copy mode or a synchronous copy mode;

said first data storage apparatus having:

a first data medium to store data sent from said host computer;

a first cache memory; and

a first controller configured to move data into and out of said first data medium and said first cache memory;

said second data storage apparatus having:

a second data medium to store data sent from said first data storage apparatus;

a second cache memory; and

a second controller configured to move data into and out of said second data medium and said second cache memory;

wherein said asynchronous copy mode is used between said first data storage apparatus and said second data storage apparatus while said first controller does not detect probability of data loss in said first data storage apparatus, and

wherein said copy mode changes from said asynchronous copy mode to said synchronous copy mode when said first controller detects said probability of data loss in said first data storage apparatus.

26. (new) The data storage system according to claim 25, wherein said copy mode changes from said asynchronous copy mode to said synchronous copy mode when said first controller detects an earthquake.

27. (new) The data storage system according to claim 25, wherein said copy mode changes from said asynchronous copy mode to said synchronous copy mode when said first controller detects a trouble or a trouble sign of a supply voltage in said first data storage apparatus.

28. (new) The data storage system according to claim 25, wherein said copy mode changes from said asynchronous copy mode to said synchronous copy mode when said first controller detects said probability of data loss in said first cache memory in said first data storage apparatus.

29. (new) The data storage system according to claim 25 wherein said first data storage apparatus further has a detection part to detect said probability of data loss in said first data storage apparatus.

30. (new) The data storage system according to claim 25, further comprising a third data storage apparatus having:

a third data medium to store data sent from said host computer;

a third cache memory; and

a third controller configured to move data into and out of said third data medium and said third cache memory;

wherein when one of said first data storage apparatus and said third data storage apparatus detects probability of data loss, said one of data storage apparatus notifies the other of data storage apparatus of said probability of data loss.

31. (new) A data storage system comprising:

a first data storage apparatus connected to a host computer; and

a second data storage apparatus configured to store data sent from said first data storage apparatus with an asynchronous copy mode or a non-asynchronous copy mode;

said first data storage apparatus having:

a first data medium to store data sent from said host computer;

a first cache memory; and

a first controller configured to move data into and out of said first data medium and said first cache memory;

said second data storage apparatus having:

a second data medium to store data sent from said first data storage apparatus;

second cache memory; and

a second controller configured to move data into and out of said second data medium and said second cache memory;

wherein said asynchronous copy mode is used between said first data storage apparatus and said second data storage apparatus while said first controller does not detect probability of data loss in said first data storage apparatus, and

said copy mode changes from said asynchronous copy mode to said non-asynchronous copy mode when said first controller detects said probability of data loss in said first data storage apparatus.

32. (new) A data storage system comprising:

a first data storage apparatus connected to a host computer; and

a second data storage apparatus configured to store data sent from said first data storage apparatus;

said first data storage apparatus having:

a first data medium to store data sent from said host computer;

a first cache memory; and

a first controller configured to move data into and out of said first data medium and said first cache memory;

said second data storage apparatus having:

a second data medium to store data sent from said first data storage apparatus;

a second cache memory; and

a second controller configured to move data into and out of said second data medium and said second cache memory;

wherein said first controller returns a report of completion of writing to said host computer on said first data storage apparatus's completing storing data concerning a request to write from said host computer while said first controller does not detect probability of data loss in said first data storage apparatus, and

wherein said first controller returns a report of completion of writing to said host computer on both said first data storage apparatus's and said second data storage apparatus's completing storing data concerning a request to write from said host computer after said first controller detects said probability of data loss in said first data storage apparatus.

33. (new) A data storage system comprises

a first data storage apparatus connected to a host computer; and

a second data storage apparatus configured to store data sent from said first data storage apparatus with an asynchronous copy mode or a synchronous copy mode;

said first data storage apparatus having:

a first data medium to store data sent from said host computer;

a first cache memory; and

a first controller configured to move data into and out of said first data medium and said first cache memory; and

an asynchronous/synchronous anode switching part switching said copy mode from said asynchronous copy mode to said synchronous copy mode after said first controller detects probability of data loss in said first data storage apparatus;

said second data storage apparatus having:

a second data medium to store data sent from said first data storage apparatus;

a second cache memory; and

a second controller configured to move data into and out of said second data medium and said second cache memory.

34. (new) A data storage apparatus connected to a host computer, said data storage apparatus sending data to a backup data storage apparatus connected to said data storage apparatus with an asynchronous copy mode or a synchronous copy mode, comprising:

a data medium to store data sent from said host computer;

a cache memory; and

a controller configured to move data into and out of said data medium and said cache memory;

wherein said data storage apparatus performs copying in said asynchronous copy mode to said backup data storage apparatus while said controller does not detect probability of data loss in said data storage apparatus, and performs copying in said synchronous copy mode to said backup data storage apparatus when said controller detects said probability of data loss in said data storage apparatus.

35. (new) The data storage apparatus according to claim 34, wherein said copy mode changes from said asynchronous copy mode to said synchronous copy mode when said controller detects an earthquake.

36. (new) The data storage apparatus according to claim 34, wherein said copy mode changes from said asynchronous copy mode to said synchronous copy mode when said controller detects a trouble or a trouble sign of a supply voltage in said data storage apparatus.

37. (new) The data storage apparatus according to claim 34, wherein said copy mode changes from said asynchronous copy mode to said synchronous copy mode when said controller detects said probability of data loss in said cache memory in said data storage apparatus.

38. (new) The data storage apparatus according to claim 34, wherein said data storage apparatus further has a detection part to detect said probability of data loss in said data storage apparatus.

39. (new) A data storage apparatus connected to a host computer, said data storage apparatus sending data to a backup data storage apparatus connected to said data storage apparatus with an asynchronous copy mode or a non-asynchronous copy mode, comprising:

a data medium to store data sent from said host computer;

a cache memory; and

a controller configured to move data into and out of said data medium and said cache memory;

wherein said data storage apparatus performs copying in said asynchronous copy mode to said backup data storage apparatus while said controller does not detect probability of data loss in said data storage apparatus, and performs copying in said non-asynchronous copy mode to said backup data storage apparatus when said controller detects said probability of data loss in said data storage apparatus.

40. (new) A data storage apparatus connected to a host computer, said data storage apparatus sending data to a backup data storage apparatus connected to said data storage apparatus with an asynchronous copy mode or a synchronous copy mode, comprising:

a data medium to store data sent from said host computer;

a cache memory; and

a controller configured to move data into and out of said data medium and said cache memory;

wherein said controller returns a report of completion of writing to said host computer on said data storage apparatus's completing storing data concerning a request to write from said host computer while said controller does not detect probability of data loss in said data storage apparatus, and

said controller returns a report of completion of writing to said host computer on both said data storage apparatus's and said backup data storage apparatus's

completing storing data concerning a request to write from said host computer after said controller detects said probability of data loss in said data storage apparatus.

41. (new) A data storage apparatus connected to a host computer, said data storage apparatus sending data to a backup data storage apparatus connected to said data storage apparatus with an asynchronous copy mode or a synchronous copy mode, comprising:

a data medium to store data sent from said host computer

a cache memory;

a controller configured to move data into and out of said data medium and said cache memory; and

an asynchronous/synchronous mode switching part switching said copy mode from said asynchronous copy mode to said synchronous copy mode after said controller detects probability of data loss in said data storage apparatus.

42. (new) A data storage apparatus comprising:

at least one of a plurality of storage media;

a cache memory;

a controller configured to move data into and out of said at least one of a plurality of storage media and said cache memory; said controller further configured to receive data from an external source for storage; and

a sensor configured to detect a probable occurrence of an event external of the data storage system;

wherein responsive to said sensor detecting a probable occurrence of the event, said controller copies data from said cache memory to said at least one of a plurality of storage media.

43. (new) A data storage apparatus comprising:

at least one of a plurality of storage media;

a cache memory;

a controller operable to move data into and out of said at least one of a plurality of storage media and said cache memory; said controller further operable to receive data from an external source for storage; and

a sensor;

wherein responsive to said sensor detecting a probable occurrence of an event, said controller copies data from said cache memory to said at least one of a plurality of storage media, and said controller receiving data from said external source delays sending an acknowledgment to said external source until said data is copied into said at least one of a plurality of storage media.

44. (new) A data storage apparatus comprising:

at least one of a plurality of storage media;

a cache memory;

a controller configured to move data into and out of said at least one of a plurality of storage media and said cache memory; said controller further configured to receive data from an external source for storage; and

a sensor;

wherein responsive to said sensor detecting a probable occurrence of an event, said controller copies data from said cache memory to said at least one of a plurality of storage media, and said controller receiving data from said external source for storage is temporarily suspended while said controller copying said data from said cache memory to said at least one of a plurality of storage media is performed.

45. (new) A data storage apparatus comprising:

at least one of a plurality of storage media;

a cache memory;

a controller configured to move data into and out of said at least one of a plurality of storage media and said cache memory; said controller further configured to receive data from an external source for storage; and

a sensor;

wherein responsive to said sensor detecting a probable occurrence of an event, said controller copies data from said cache memory to said at least one of a plurality of storage media, and said controller copying said data from said cache memory to said at least one of a plurality of storage media is performed with a higher priority than said controller receiving data from said external source for storage.

46. (new) A data storage apparatus comprising:

at least one of a plurality of storage media;

a cache memory;

a controller configured to move data into and out of said at least one of a plurality of storage media and said cache memory; said controller further configured to receive data from an external source for storage; and

a sensor; and

a link to a remotable storage system;

wherein responsive to said sensor detecting a probable occurrence of an event, said controller copies data from said cache memory to said at least one of a plurality of storage media, and

wherein said controller copying data from said cache memory further comprises said controller copying said data over said link to said remotable storage system.

47. (new) A data storage apparatus comprising:

at least one of a plurality of storage media;

a cache memory;

a controller configured to move data into and out of said at least one of a plurality of storage media and said cache memory; said controller further configured to receive data from an external source for storage; and

a sensor; and

a link to a remotable storage system;

wherein responsive to said sensor detecting a probable occurrence of an event, said controller copies data from said cache memory to said at least one of a plurality of storage

media, and said controller copying data from said cache memory further comprises said controller copying said data over said link to said removable storage system; and

wherein said controller copying said data over said link to said removable storage system is performed asynchronously, until, responsive to said sensor detecting a probable occurrence of an event, said controller performs said copying of said data over said link to said removable storage system synchronously.

48. (new) A data storage system, comprising:

a first data storage system, said first data storage system further comprising:

a storage device that stores data received from a computer; and

a storage controller, said storage controller comprising:

a memory to hold said data temporarily, and

a recognition part to recognize a possibility of an event;

a data link; and

a second data storage system, connected by said data link to said first data storage system;

wherein when said recognition part of said first data storage system provides a warning of a possibility of an event, thereupon said storage controller of said first data storage system copies data stored in said memory to said second data storage system over said data link.